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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/813,834	03/22/2001	Jae Sung Roh	0465-0826P	3138

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EXAMINER

OWENS, DOUGLAS W

ART UNIT	PAPER NUMBER
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2811

DATE MAILED: 05/22/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application N .

09/813,834

Applicant(s)

ROH ET AL.

Examiner

Douglas W Owens

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-9 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-9 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 March 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☒ Certified copies of the priority documents have been received in Application No. 08/931,238.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4.
- ☒ Interview Summary (PTO-413) Paper No(s) \_\_\_\_.
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other:

**DETAILED ACTION**

***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

2. Claims 1-4 are rejected under 35 U.S.C. 102(e) as being anticipated by US patent No. 6,140,705 to Liu.

Regarding claim 1, Liu teaches a semiconductor device having a self aligned contact hole, said device comprising:

a substrate (10);  
first (14) and second (16) conductor structures;  
an insulator structure (26) on the first and second conductor structures and on the substrate except between the conductor structures;  
sidewall spacers (40) on the sides of the conductor structures and the insulator structure, said spacers manifesting a self aligned contact hole region between the conductor structures.

Regarding claim 2, Liu teaches a semiconductor device, wherein the conductor structures are gate structures.

Regarding claim 3, Liu teaches a semiconductor device, wherein the conductor structures comprise:

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a gate oxide layer (12);

a conductive layer (14) on the gate oxide; and

a gate cap insulating layer (18) on the conductive layer.

Regarding claim 4, Liu teaches a semiconductor device, further comprising a further a contact plug (42).

***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 5-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Liu in view of US patent No. 5,790,452 to Lien.

Regarding claims 5 and 6, Liu teaches a semiconductor device using a self-aligned contact hole, said semiconductor device comprising:

a substrate with impurities in it;

first and second conductor structures;

first sidewall spacers (40) on the conductor structures and an insulative region formed over the conductor structures, said first sidewall spacers manifesting the contact hole; and

second sidewall spacers (20) opposite the first sidewall spacers and on the sides of the conductor structures.

Liu does not teach an unsymmetrical semiconductor device, wherein the impurity concentration of a first region is different from that of a second region. Lien teaches an unsymmetrical semiconductor device (Fig. 4) having one impurity concentration in one region and another impurity concentration in another region. It would have been obvious to one of ordinary skill in the art to incorporate the teaching of Lien into the device taught by Liu since it is desirable to reduce hot carrier effects.

Regarding claim 7, Liu teaches a semiconductor device further comprising:  
a contact plug in the self aligned hole, wherein the contact plug is in direct contact with the first sidewall spacers and a first impurity region.

Regarding claim 8, Liu teaches a semiconductor device, wherein the contact plug is in contact with a bitline (Col. 3, lines 63-65, and Col. 4, line 1).

Regarding claim 9, Liu teaches a semiconductor device, wherein the contact plug is not disposed directly above the conductor structures.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Douglas W Owens whose telephone number is 703-308-6167. The examiner can normally be reached on Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Thomas can be reached on 703-308-2772. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-7722 for regular communications and 703-308-7722 for After Final communications.

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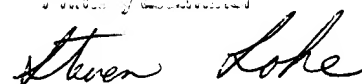
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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

DWO  
May 17, 2002

Steven Loh  
Primary Examiner

A handwritten signature in cursive script that reads "Steven Loh".